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13. Abstract (Maximum 200 words). Young sea ice with a snow cover experiences rapid metamorphosis at the snow ice interface due to the high salinity at the ice surface and the insulating effects of the snow. As a result, a slush layer often appears even under cold conditions which gives rise to significant modifications in the microwave signatures. Time series of observations and accompanying analysis will be reported for selected cases. Bare young sea ice which underwent several melt-freeze cycles was also observed. In this case the ice sheet became almost completely desalinated giving rise to a stable signature intermediate between those of open water and the original ice sheet. Observations and a brief theoretical study will be presented. Keywords: Sea ice/salinity; Desalination; Microwaves/signatures; Melting/freezing/cycles; Electromagnetic wave reflections. (MM) ←					
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MICROWAVE SIGNATURES AND PHYSICAL CHARACTERISTICS OF SNOW COVERED AND DESALINATED YOUNG SEA ICE

T. C. Grenfell, A. W. Lohanick and C. T. Swift

Young sea ice with a snow cover experiences rapid metamorphosis at the snow ice interface due to the high salinity at the ice surface and the insulating effects of the snow. As a result, a slush layer often appears even under cold conditions which gives rise to significant modifications in the microwave signatures. Time series of observations and accompanying analysis will be reported for selected cases.

Bare young sea ice which underwent several melt-freeze cycles was also observed. In this case the ice sheet became almost completely desalinated giving rise to a stable signature intermediate between those of open water and the original ice sheet. Observations and a brief theoretical study will be presented.

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PASSIVE MICROWAVE OBSERVATIONS
of
Desalinated & Snow Covered Young Saline Ice

U of Wash - T.C. Grenfell et al

U of Mass - C.T. Swift et al

NORDA @ CREL - A.W. Lohanick et al.

Results from 1983/4 1984/5 1987/8
and 1988/9 seasons.

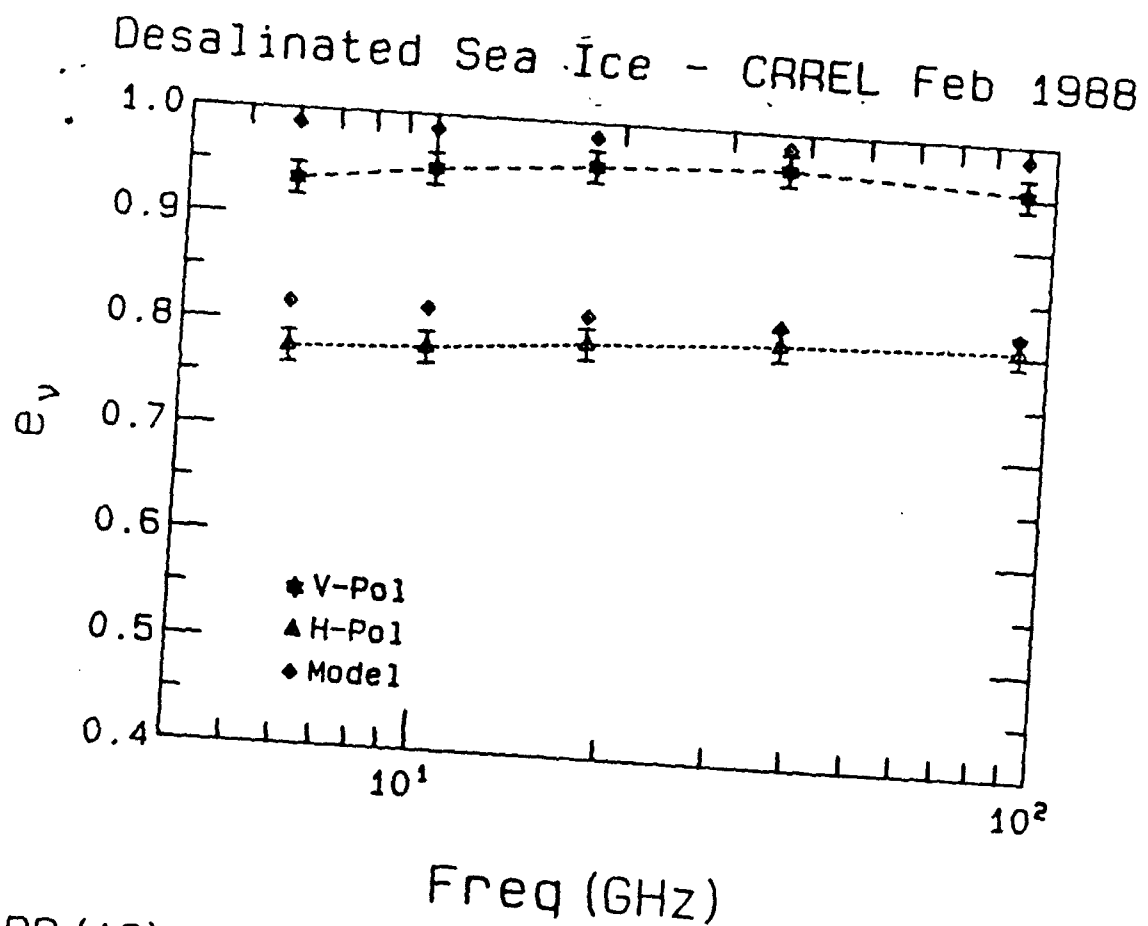
I. Simulated "Old Ice"

What we saw

How well we did.

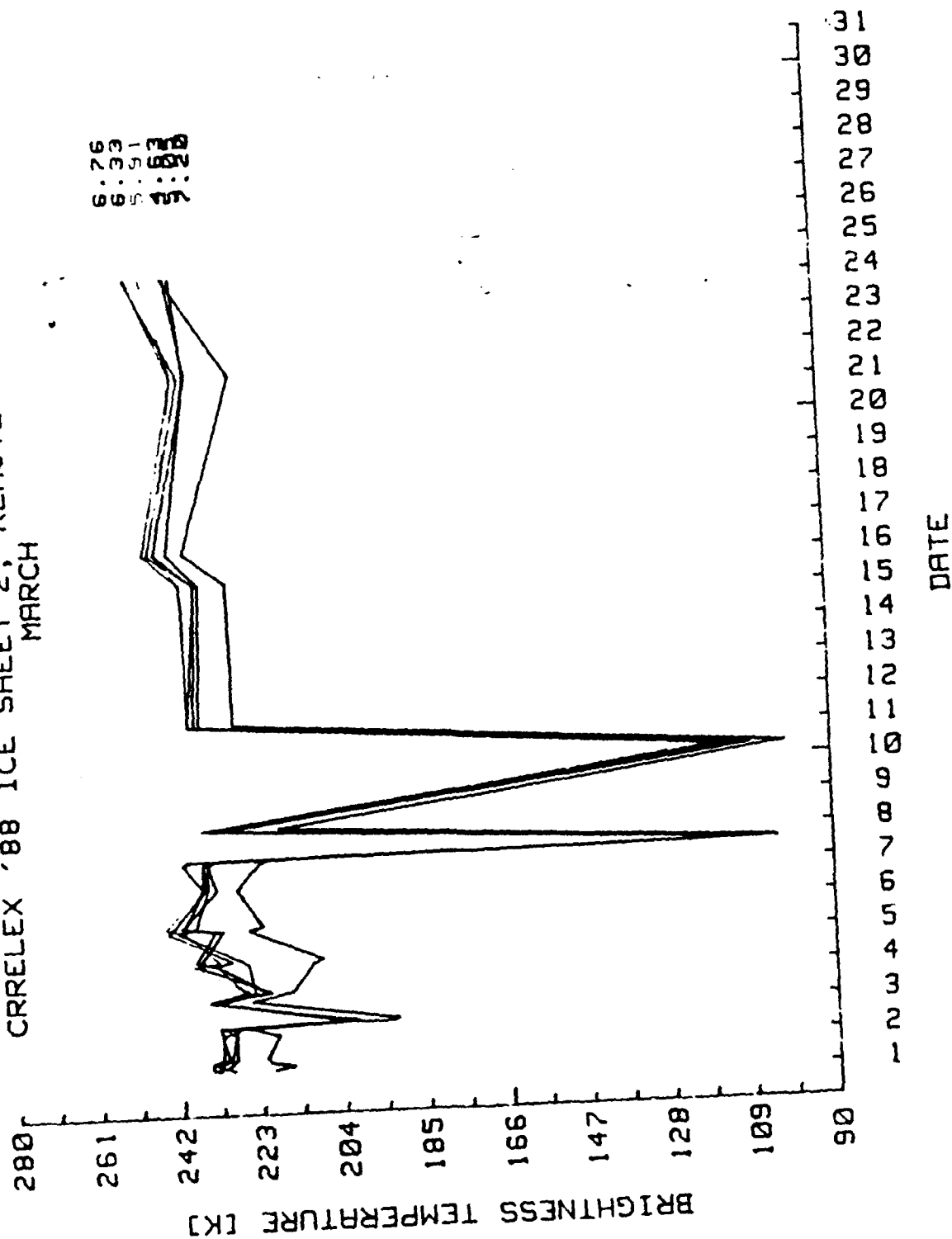
II. Snow Covered Ice

Contributing Effects

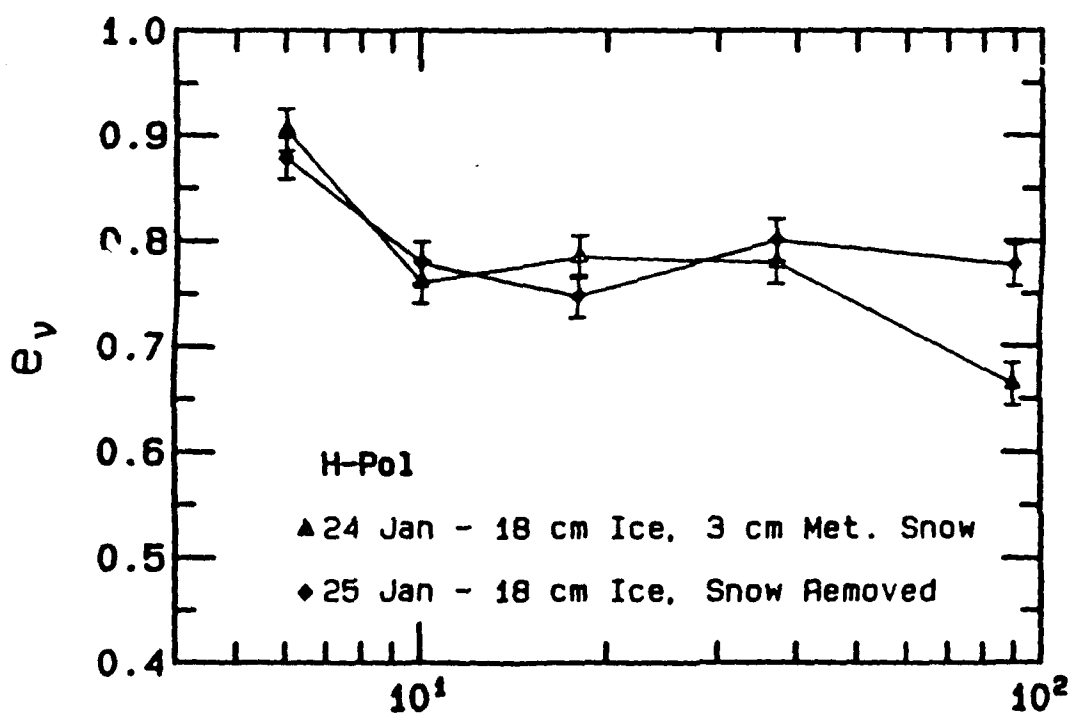
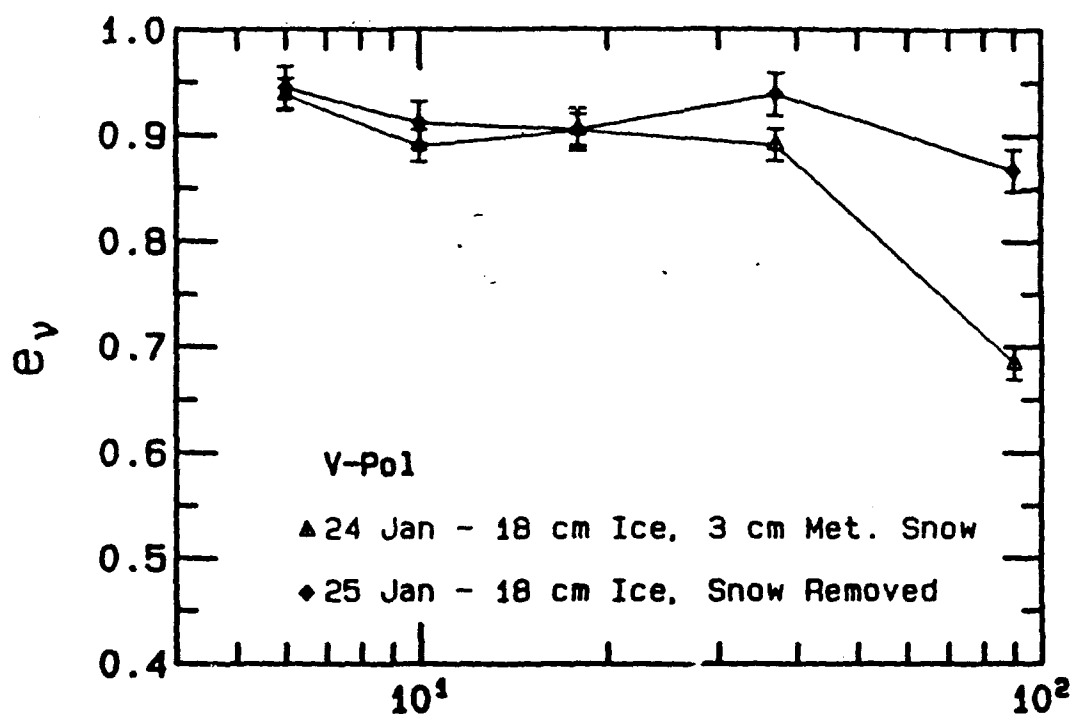


$\epsilon''=0$, PR (18) = .096, PR (37) = .094, PR (90) = .085 <nasiw5a>

CRRELEX '88 ICE SHEET 2; REMOTE OBSERVATIONS MARCH



CRAEL 1989 Drained Blocks

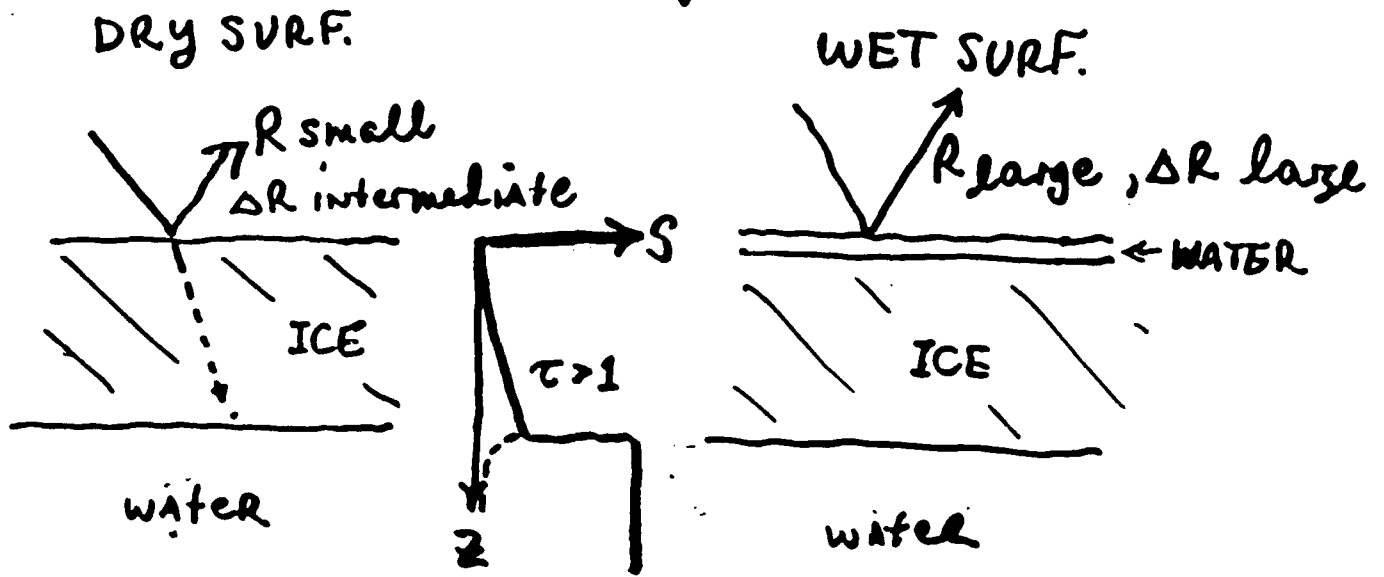


Freq (GHz)

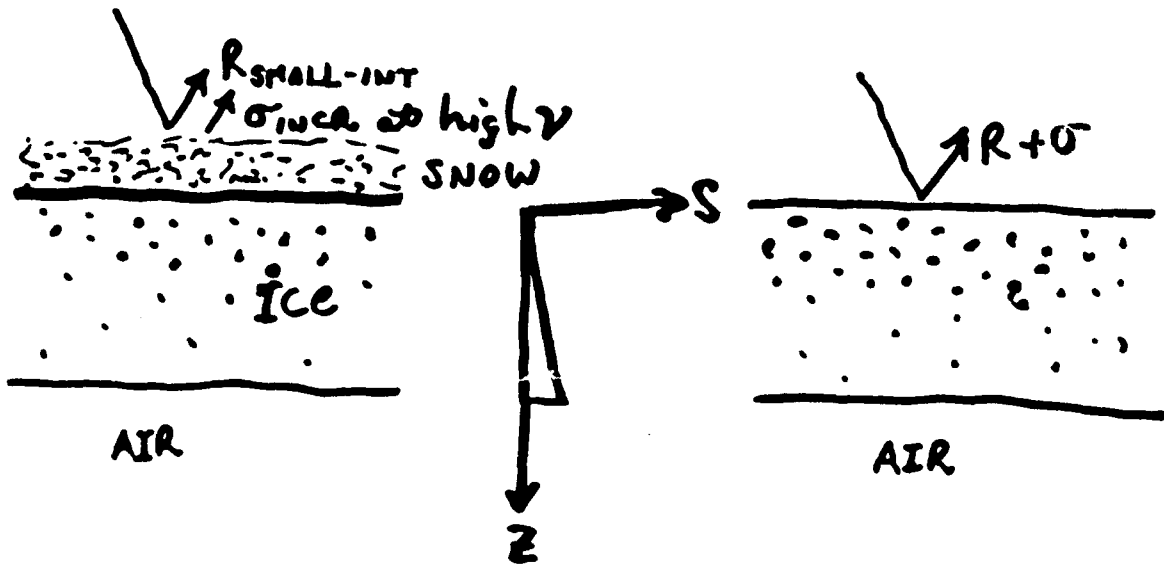
<nasiw6a&b>

$$\epsilon \approx 1 - R - \beta \quad \Delta R = R_{\text{VPOL}} - R_{\text{HPOL}}$$

1988 Desalin. Ice



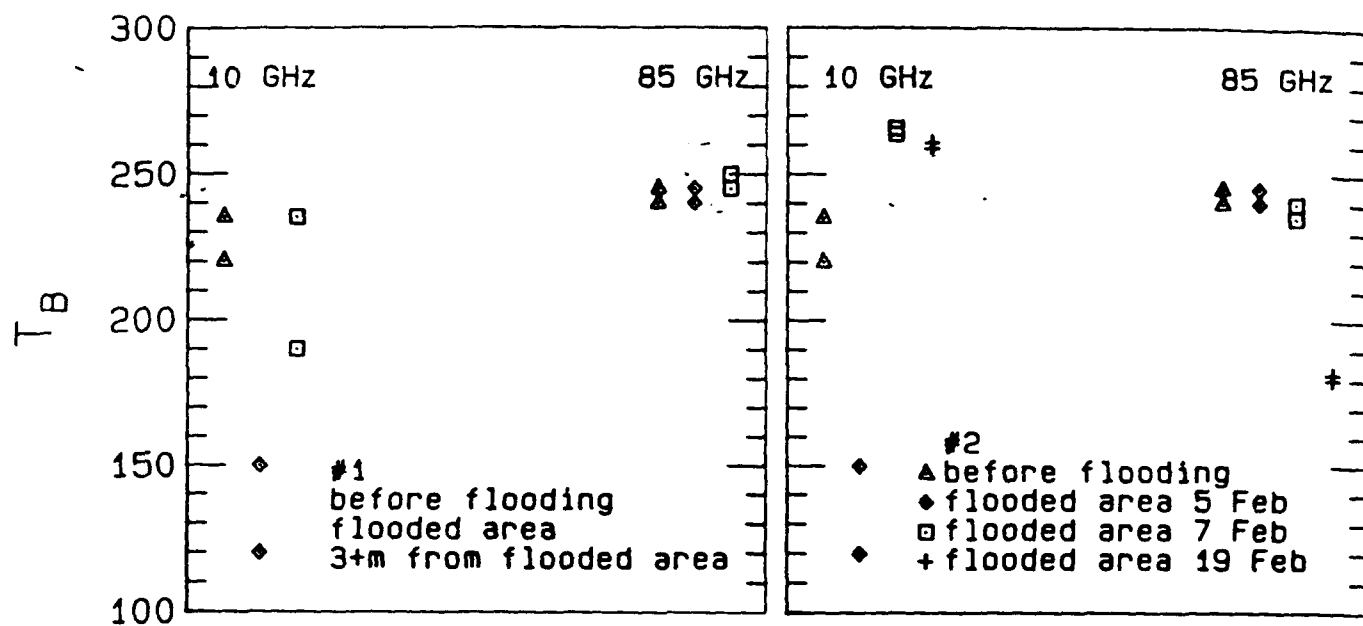
1989 Drained Blocks



CAREL 1987/88 Snow Observations

5 Feb 88

5 to 19 Feb 88



CONCLUSIONS

OI/MYI Simulation - not enough volume scattering yet.

Snow Effects to Account for / Exploit

1. Volume scattering at higher λ 's.
2. "Thin" film interference effects.
3. Flooding at the base of the snow layer;
4. Subsequent metamorphism / Refreezing.